Claims

[c1] In an electron beam tomography (EBT) scanner for scanning a subject during a scanning time interval, a method to generate an image from a data set collected from said subject beginning at an arbitrary time within said scanning time interval, said method comprising:
generating a sequence of temporally separated, unfolded parallel view sinograms corresponding to scans through said subject during a scanning time interval;
folding data from a first region of view angles from each of said sinograms into a second region of view angles in a corresponding next temporally adjacent sinogram;
folding data from a third region of view angles from each of said sinograms into a fourth region of view angles in a corresponding previous temporally adjacent sinogram; and
generating an image from a subset of data taken from said sinograms wherein said subset of data begins at an arbitrary time within said scanning time interval.

[c2] The method of claim 1 wherein said folding comprises:
weighting a first set of data corresponding to one region of view angles of one sinogram and weighting a second set of data corresponding to a different region of view angles of a different corresponding temporally adjacent sinogram to form a first weighted set of data and a second weighted set of data;
summing together said first weighted set of data and said second weighted set of data to form a folded set of data; and
replacing said second set of data with said folded set of data within said different region of view angles.

[c3] The method of claim 1 wherein said unfolded parallel view sinograms are generated from fan view sinograms.

[c4] The method of claim 1 wherein said generating an image includes applying a reconstruction algorithm to said subset of data.

[c5] The method of claim 1 wherein each of said sinograms is gathered over

scanning view angles comprising at least a total of π radians.

[c6] The method of claim 1 wherein said first region of view angles comprises angles greater than π radians.

[c7] The method of claim 1 wherein said second region of view angles comprises angles greater than 0 radians.

[c8] The method of claim 1 wherein said third region of view angles comprises angles less than 0 radians.

[c9] The method of claim 1 wherein said fourth region of view angles comprises angles less than π radians.

[c10] The method of claim 1 further comprising selecting said arbitrary time within said scanning time interval to determine whether or not an imaged feature is an artifact.

[c11] The method of claim 1 wherein said method reduces motion artifacts within said image.

[c12] In an electron beam tomography (EBT) scanner for scanning a subject during a scanning time interval, apparatus to generate an image from a data set collected from said subject beginning at an arbitrary time within said scanning time interval, said apparatus comprising:
a sinogram pre-processing module generating a sequence of temporally separated, unfolded parallel view sinograms corresponding to scans through said subject during a scanning time interval;
a sinogram data folding module folding data from a first region of view angles from each of said sinograms into a second region of view angles in a corresponding next temporally adjacent sinogram, and said sinogram data folding module folding data from a third region of view angles from each of said sinograms into a fourth region of view angles in a corresponding previous temporally adjacent sinogram; and
an image processing module generating image data from a subset of data taken from said sinograms wherein said subset of data begins at an arbitrary time

within said scanning time interval.

[c13] The apparatus of claim 12 further comprising a monitor to display said image data as a video image.

[c14] The apparatus of claim 12 further comprising an electron gun in a vacuum chamber housing to generate an electron beam within said EBT scanner.

[c15] The apparatus of claim 12 further comprising at least one X-ray target to generate at least one fan beam of X-rays when impinged upon by an electron beam of said EBT scanner.

[c16] The apparatus of claim 12 further comprising a detector array to detect X-rays emitted by at least one X-ray target of said EBT scanner.

[c17] The apparatus of claim 12 further comprising a system control module to control various functions of said EBT scanner including scanning.

[c18] The apparatus of claim 12 wherein said first region of view angles comprises angles greater than π radians.

[c19] The apparatus of claim 12 wherein said second region of view angles comprises angles greater than 0 radians.

[c20] The apparatus of claim 12 wherein said third region of view angles comprises angles less than 0 radians.

[c21] The apparatus of claim 12 wherein said fourth region of view angles comprises angles less than π radians.

[c22] The apparatus of claim 12 wherein said apparatus reduces motion artifacts within said image.